10:45

788-2 Thallium-201 Rest-Redistribution SPECT to Predict Improvement of Global Ventricular Function After Revascularization

J.J. Bax, J.H. Cornel[1], F.C. Visser[2], P.M. Fioretti[3], A. Elhendy[3], C.A. Visser[2]. *Leiden, The Netherlands,* [1] *Alkmaar, The Netherlands,* [2] *Amsterdam, The Netherlands,* [3] *Rotterdam, The Netherlands*

Thallium-201 rest-redistribution (Tl RR) imaging has been used to predict improvement of regional left ventricular (LV) function after revascularization. In the current study we have evaluated the use of Tl RR SPECT to predict improvement of global LV function after revascularization. Thirty-one patients with contractile dysfunction underwent Tl RR SPECT and resting echocardiography before either PTCA (n = 9) or CABG (n = 22). The echocardiographic and SPECT images were analyzed using a 13-segment model. Dysfunctional segments showing either normal perfusion, mildly reduced but fixed Tl uptake or significant redistribution were considered viable. LVEF was assessed before and 3 months after revascularization by echocardiography and radionuclide ventriculography. Improvement of LVEF ≥5% was considered significant. The patients were divided into 2 groups, according to the number of dysfunctional but viable segments on Tl RR SPECT (≤ 3 versus >3 segments). Four of the 17 (24%) patients with ≤ 3 dysfunctional but viable segments improved in LVEF. In contrast, all 8 (100%) patients with >3 dysfunctional, viable segments improved in LVEF. Moreover, a linear relation existed between the number of dysfunctional, viable segments and the improvement in LVEF ($y = 1.36*x - 1.7$, $r = 0.70$).

These data suggest that the patients with >3 dysfunctional but viable segments on Tl RR SPECT are likely to improve in global LV function after revascularization, and that the number of dysfunctional, viable segments is predictive for the improvement of LVEF.

11:00

788-3 Gated Technetium-99m SPECT Imaging Predicts Myocardial Viability in Revascularized Patients

B. Shareef, A.W. Ahlberg, M.G. Levine, S. Giri, J.M. Piriz, A. Russel, D. Waters, G.V. Heller. *Hartford Hospital, University of Connecticut, Hartford, CT, USA*

Myocardial perfusion imaging (MPI) is an accepted means to predict myocardial viability. Gated SPECT imaging with Tc-99m sestamibi (GPI) permits assessment of wall motion (WM) in addition to MPI. To evaluate the use of GPI in viability assessment, we prospectively evaluated 26 pts with rest gated Tc-99m SPECT sestamibi imaging pre-revascularization, 1 and 6 week post-revascularization (PTCA = 16, CABG = 14). Images were graded by 3 blinded readers using a 17-segment model. A total perfusion score of ≤ 10 and a WM score of ≤ 3 were considered viable. Individual total vascular defect and WM score were assessed for territories (LAD, CX, RCA) that were revascularized.

Results: Thirty vascular territories were analyzed. Viability was correctly predicted at either 1 or 6 weeks in 22 out of 30 territories by GPI. The prediction of perfusion score improvement post revascularization was significantly higher with GPI than with MPI alone. Sensitivity, specificity and positive predictive value (PPV) are as follows:

	MPI	GPI
Sensitivity:	54%	92%
Specificity:	15%	83%
PPV:	68%	81%

	Viability	
	present	absent
Viability by GPI+	22	5
Viability by GPI–	2	1

Conclusion: Gated Tc-99m sestamibi SPECT imaging predicts myocardial viability better than perfusion imaging alone.

11:15

788-4 Detection of Myocardial Viability by Dual-Isotope Tc-99m-Tetrofosmin and 18-FDG Single Photon Emission Tomography after Acipimox to Stimulate Glucose Uptake

R. Valkema, D. Poldermans, A. Reijs, J. van Peski, R. Rambaldi, J. Bax, P. Fioretti, E. Krenning. *Erasmus University, Rotterdam, The Netherlands*

Aim: To study the ability of the Picker Prism 3000 3-head camera, fitted with ultra high energy (UHE) collimators, for assessment of myocardial I viability using dual-isotope simultaneous acquisition (DISA) SPECT with Tc-99m-Tetrofosmin and 18-FDG, after Acipimox. We compared with dobutamine stress echocardiography (DSE).

Methods: Forty-one pts with coronary artery disease, with mean ejection fraction 30% (range 11–39%) were studied with DISA-SPECT and DSE prior to revascularization. DSE was performed using dobutamine (5, 10, 20, 30, 40, and 40 μg/kg/min. with atropine). Standard views were obtained.

Sixty min. after 600 MBq Tc-99m-Tetrofosmin i.v. at rest, SPECT (low energy high resolution (LEHR) collimators, 360º, 3º steps of 30 sec.) was obtained. Acipimox (250 or 500 mg p.o.) in combination with a light carbohydrate-rich meal was given to stimulate myocardial 18-FDG uptake. Ninety min. later 185 MBq 18-FDG was injected; DISA-SPECT (UHE, 360º, 3º steps of 30 sec.) was started 45 min. post injection. For comparative analysis 16 segments were visually scored for DSE and DISA-SPECT, independently of each other. Segments with severe hypokinesis, akinesis, or dyskinesis at rest were scored for viability (improved wall motion during dobutamine infusion or ischemia with DSE; normal FDG/Tetrofosmin uptake or mismatch with DISA-SPECT, respectively) or scar. Segments without severe dyssynergies at rest were scored as "normal".

Results: The image quality of the Tetrofosmin perfusion images from DISA-SPECT was slightly inferior to the initial rest images with the LHER collimators, but the diagnostic value of both sets was the same. The myocardial 18-FDG uptake was good in most patients, yielding images of good quality. Of the 646 segments, 255 showed severe dyssynergy at rest. Of these 255, 28 were considered viable and 153 non-viable with both techniques; 33 segments with viability by DSE showed no viability with DISA-SPECT, and 41 non-viable segments by DSE showed viability with DISA-SPECT (agreement 71%).

Conclusion: Tc-99m-Tetrofosmin and 18-FDG DISA-SPECT with a 3-head camera after stimulated myocardial glucose uptake by Acipimox is a promising technique for assessment of myocardial viability. Further clinical follow-up in a larger group after revascularization is needed.

11:30

788-5 Dobutamine Tc-99m Sestamibi Gated SPECT: New Method for Myocardial Viability Assessment in Patients with Left Ventricular Dysfunction and Coronary Artery Disease

N. Zafrir, N. Avraham, J. Sulkes, S. Sclarovsky. *Rabin Medical Center, Beilinson Campus, Petah Tikva, Israel*

Perfusion imaging and dobutamine echocardiography are common but different modalities for myocardial viability assessment. This study investigates the use of dobutamine with sestamibi gated SPECT (GS) imaging, a new method which enables us to assess myocardial viability concomitantly by perfusion and contractile reserve. Twenty-one patients (pts) with triple coronary artery disease and severe left ventricular dysfunction were studied. All were intravenously injected with 30 mci of Tc-99m sestamibi for first-pass acquisition (mean EF 28 ± 5%). One hour later resting GS imaging was performed followed by infusion of dobutamine, starting dose 5 μg/kg/min, followed by 10 μg/kg/min for 5 min and throughout imaging. After processing, the myocardium was divided into 5 territories (T): septum, apex, anterior, inferior and lateral. Each was assessed for normal perfusion (>80% uptake), ab-normal (Ab)-viable (80–50% uptake) and Ab-nonviable (<50% uptake). Wall motion (WM) was assessed visually as normal, ab-viable if it improved with dobutamine and ab-nonviable if it did not. Interobserver variability was 8%. The agreement between WM and perfusion was 64%. Ninety-one T (87%) had Ab WM, of which 48 (53%) showed WM improvement with dobutamine and 57 (63%) were considered viable by perfusion (NS). Of the latter, 43/57 (75%) had WM improvement with dobutamine, in contrast to only 5 of 34 T (15%) considered nonviable by perfusion ($P < 0.001$). *Conclusion:* Dobutamine gated GS may be a useful method to assess myocardial viability both by perfusion and contractile reserve. However, its predictive value regarding functional improvement after revascularization needs to be explored.

11:45

788-6 Prediction of Improvement of Global Function After Revascularization in Patients with Ischemic Left Ventricular Dysfunction; Detection by F18-Fluorodeoxyglucose SPECT

J.J. Bax, J.H. Cornel, F.C. Visser, P.M. Fioretti, C.A. Visser. *Free University Hospital, Amsterdam, The Netherlands*

Many studies have focussed on the prediction of regional left ventricular (LV) function after revascularization. Although clinically more important, data on the prediction of improvement of global LV function are scarce. We evaluated the use of F18-fluorodeoxyglucose (FDG) and single photon emission computed tomography (SPECT) to predict improvement of global LV function after